CLAIMS

1. A steel tower (1) for a windmill, comprising a number of cylindrical or tapered tower sections (2), at least the wider sections (2) of which being subdivided into two or more elongated shell segments (3), which combine into a complete tower section (2) by means of vertical flanges (6) tightened together, e.g. by bolts (10), said shells being also provided with upper and lower horizontal flanges (4), respectively, to allow interconnection of tower sections (2) one on top of the other.

2. A steel tower according to claim 1, wherein at least one of the tower sections (2) is being divided into three segments (3) of essentially equal arc length, i.e. 120 ° each.

3. A steel tower according to claim 1 or 2, wherein a shell segment (3) comprises at least two lengths of segments (3) welded together along their abutting horizontal edges and being fitted with horizontal flanges (4) along the free uppermost and lowermost edges, said flanges (4) being provided with a number of throughholes (5) for interconnecting bolts.

4. A steel tower according to any of the preceding claims, wherein the vertical flanges (6) are welded onto the shell segments (3) offset from the corresponding edges by a distance leaving a space between opposing surfaces of flanges (6) for a spacer bar (9) sandwiched between them, as flanges are bolted together.

5. A steel tower according to any of the preceding claims, wherein said spacer bar (9) is provided with throughholes matching the holes in the flanges (6), and preferably each hole in the spacer bar (9) has a notch extending from the edge of the bar (9) into the hole and wide enough to allow lateral sliding of the bar (9) over a bolt (10).

6. A steel tower according to any of the preceding claims, wherein the vertical and/or horizontal joints between segments (3) and sections (2), respectively, are being covered by inserting a filler material and/or a filler element (12).

7. A steel tower according to any of the preceding claims, wherein a shell segment (3) is provided with fitting out in the form of e.g. a ladder section and cable fixtures before being transported to the building site.

8. Method of building a large size, cylindrical or tapered tower (1) for a windmill, of single-walled steel tower sections (2) from prefabricated shell segments (3), whereby at least the wider sections (2) are divided into segments (3) along vertical lines (11) and interconnected by flanges (4,6) provided along the edges thereof, comprising the steps of:

a) providing two or more tower shell segments (3) from a rolled steel plate having the required radius of curvature, said shells forming in unison a complete circumferential tower section (2),

b) providing each shell segment (3) with vertical and horizontal connecting flanges (6,4) along free edges thereof,

c) mounting one or more shell segments (3) on a transportation carriage or supporting frame (13),

d) transporting said supported segments (3) to the building site,

e) mounting the shell segments (3) together along their vertical flanges (6) to provide one or more tower sections (2) by connecting means (10), e.g. bolts,

f) mounting tower sections (2) on top of each other by connecting them along their opposing horizontal flanges (4) by connecting means, e.g. bolts.

9. Method according to claim 8, wherein said rolled steel plate in step a) constitutes a 360° shell, which is initially being welded together to form a cylindrical or tapered tower section (2), and then it is cut into the number of elongated shell segments (3) required.

10. Method according to claim 8 or 9, wherein previous to step a), an optional number of rolled steel plates in the form of elongated shell segments (3), are being welded together along their abutting horizontal edges to establish larger lengths of tower shell.

11. Method according to any preceding method claim, wherein the flanges (4,6) in step b) are being welded in a position pointing towards the center of the tower (1).

12. Method according to any of the preceding method claims, wherein the vertical flanges (6) are being welded in such distance from the edge of the respective shell that a spacer bar (9) could be sandwiched between the flanges (6) as they are tightened together.

13. Method according to claim 12, wherein a vertical joint (11) visible after interconnecting two neighbour shells via an intermediary spacer bar (9) is being covered by inserting a filler material and/or a filler element (12).

14. Method according to any of the preceding method claims, wherein interconnection of horizontal flanges (4) is performed after offsetting the vertical division lines (11) of neighbour tower sections.

15. Method according to any of the preceding method claims, wherein fitting out each shell with necessary ladders etc. is performed before transportation to the site.

16. Method according to any of the preceding method claims, wherein all parts of the tower structure (1) are being surface treated in the workshop before being transported to the building site.

17. Transportation carriage to be used in steps c) and d) of the method according to any of the claims 8-16, wherein said carriage consists of a support frame (13) for transportation thereof, with a number of supports (14) carrying a shell segment length ready for transportation, said support frame (13) being movable, e.g. by means of wheels (15) and being hauled by a truck.